

cooperating with the second side of the center platen so as to define a second separation plane, the center platen and the first and second mold portions being arranged in a stack mold configuration wherein the injection molding machine is provided with a plurality of first, smaller cavities positioned adjacent the first separation plane and a plurality of corresponding second, larger cavities positioned adjacent the second separation plane;

controlling the temperature of the injection molding machine differently adjacent the first and the second separation planes;

injection molding the first components in the first cavities;

unmolding the first components from the first cavities;

transferring the first components from the first separation plane to the second separation plane;

placing the first components into the second cavities;

injection molding the second components on the first components within the second cavities so as to form the plastic material articles; and

unmolding the plastic material articles from the second cavities.

29. (New) A method of injection-molding plastic material articles having at least first and second components, the method comprising the steps of:

(i) providing an injection molding machine comprising a center platen having a first side and an opposite second side, a first mold portion cooperating with the first side of the center platen so as to define a first separation plane, and a second mold portion cooperating with the second side of the center platen so as to define a second separation plane, the center platen and the first and second mold portions being arranged in a stack mold configuration wherein the injection molding machine is provided with a plurality of first, smaller cavities positioned adjacent the first separation plane and a plurality of corresponding second, larger cavities positioned adjacent the second separation plane;

(ii) injection molding the first components in the first cavities;

(iii) unmolding the first components from the first cavities;

(iv) transferring the first components from the first separation plane to the second separation plane;

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- (v) placing the first components into the second cavities;
- (vi) injection molding the second components on the first components within the second cavities so as to form the plastic material articles; and
- (vii) unmolding the plastic material articles from the second cavities

wherein steps (iii), (v), and (vii) are performed independently of each other.

30. (New) The method of Claim 29, wherein the injection molding machine is temperature controlled differently adjacent the first and the second separation planes.

31. (New) A method of injection molding plastic material articles with an injection molding machine having at least a first mold portion cooperating with at least a second mold portion via a separation plane, the method comprising temperature controlling the injection molding machine differently in the first and second mold portions.

32. (New) The method of Claim 31, wherein the injection molding machine further comprises a center platen having a first and an opposite second side wherein the center platen is arranged in a stack mold configuration with the at least first and second mold portions wherein the first side of the center platen cooperates with the first mold portion thereby defining a first separation plane and the second side of the center platen cooperates with the second mold portion thereby defining a second separation plane, the method comprising temperature controlling the injection molding machine differently in the first and second separation planes.

33. (New) The method of Claim 32, wherein the injection molding machine is provided with a plurality of first, smaller cavities adjacent the first separation plane and a plurality of second, larger cavities adjacent the second separation plane and wherein the method comprises injection forming the plastic material articles in the first and second cavities.

34. (New) A method of injection molding plastic material articles having at least first and second components, the method comprising the steps of:

injection molding the first component; and

injection molding the second component to the first component such that the second component substantially encases the first component.

35. (New) A method of injection molding plastic material articles having at least first and second components, the method comprising the steps of:

injection molding the first component; and

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injection molding the second component to the first component such that the second component extends through the first component.

36. (New) An apparatus for injection-molding plastic material articles having at least first and second components, the apparatus having open and closed configurations and the apparatus comprising:

a center platen having a first and an opposite second side;

a first mold portion cooperating with the first side of the center platen thereby defining a first separation plane;

a second mold portion cooperating with the second side of the center platen thereby defining a second separation plane wherein the open configuration is defined by the center platen and the first and second mold portions being distanced from each other along a separation axis thereby defining gaps therebetween and wherein the closed configuration is defined by the center platen and the first and second mold portions being positioned adjacent each other;

a plurality of first, smaller cavities positioned adjacent the first separation plane;

a plurality of second, larger cavities positioned adjacent the second separation plane;

a first temperature control element positioned adjacent the first separation plane and regulating at a first temperature;

a second temperature control element positioned adjacent the second separation plane and regulating at a second temperature;

a first injector assembly providing plastic material to the first cavities so as to form the first components;

a second injector assembly providing plastic material to the second cavities so as to form the second components on the first components thereby forming the plastic material articles; and

a handling system, the handling system removing the first components from the first cavities, transferring the first components to the second separation plane, placing the first components in the second cavities, and unmolding the plastic material articles from the second cavities.

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37. (New) The apparatus of Claim 36, wherein the handling system comprises a robot having arms wherein the arms are extensible along an extension axis into the gaps between the center platen and the first and the second mold portions when the apparatus is in the open configuration wherein the arms extend substantially along the extension axis and wherein the extension axis is substantially perpendicular to the separation axis.

38. (New) The apparatus of Claim 37, wherein the arms comprise a first arm extensible into the first separation plane wherein the first arm is provided with seats for the first components and a second arm having two sides extensible into the second separation plane wherein the second arm is provided with seats on the two sides for the plastic material articles wherein one of the sides of the second arm faces the first arm and the other side of the second arm is opposite the first arm.

39. (New) The apparatus of Claim 38, wherein the second arm comprises two sub-arms each having opposing sides wherein the seats of the second arm are positioned on the opposing sides of the two sub-arms.

40. (New) The apparatus of Claim 38, further comprising a transfer station having a rest position wherein the transfer station transfers the first components from the seats of the first arm to the seats of the second arm.

41. (New) The apparatus of Claim 40, wherein the transfer station is displaceable along a transfer axis the transfer axis being substantially perpendicular to the extension axis.

42. (New) The apparatus of Claim 41, wherein the transfer station in the rest position is located adjacent the first arm so as to transfer the first components from the first arm to the transfer station.

43. (New) The apparatus of Claim 42, wherein, following the transfer of the first components from the first arm to the transfer station, the first arm is displaced away from the transfer axis and the transfer station is displaced so as to be adjacent the second arm.

44. (New) The apparatus of Claim 38, wherein the robot is rotatable about the extension axis such that, following rotation of the robot, the first arm is adjacent the second separation plane and the second arm is adjacent the first separation plane.

45. (New) The apparatus of Claim 44, wherein the second arm is rotatable about the extension axis.

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46. (New) The apparatus of Claim 38, further comprising a conveyor, the conveyor removing the plastic material articles from adjacent the second arm.

47. (New) The apparatus of Claim 46, wherein the plastic material articles are transferred to the conveyor from the side of the second arm opposite the first arm.

48. (New) The apparatus of Claim 46, wherein the plastic material articles are transferred to the conveyor from the side of the second arm facing the first arm.

49. (New) An apparatus for injection-molding plastic material articles having at least first and second components, the apparatus comprising:

a center platen having a first and an opposite second side;

a first mold portion cooperating with the first side of the center platen thereby defining a first separation plane;

a second mold portion cooperating with the second side of the center platen thereby defining a second separation plane;

a plurality of first, smaller cavities positioned adjacent the first separation plane;

a plurality of second, larger cavities positioned adjacent the second separation plane;

a first injector assembly providing plastic material to the first cavities so as to form the first components;

a second injector assembly providing plastic material to the second cavities so as to form the second components on the first components thereby forming the plastic material articles; and

a handling system comprising at least two arms independently extendable into the first and second separation planes, the handling system removing the first components from the first cavities, transferring the first components to the second separation plane, placing the first components in the second cavities, and unmolding the plastic material articles from the second cavities.

50. (New) The apparatus of Claim 49, further comprising:

a first temperature control element positioned adjacent the first separation plane and regulating at a first temperature; and

a second temperature control element positioned adjacent the second separation plane and regulating at a second temperature.

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51. (New) An injection molding machine for injection molding plastic material articles comprising at least a first and a second mold portion wherein the first and the second mold portions cooperate thereby defining a separation plane and further comprising a temperature controller for temperature regulating different areas of the separation plane at different temperatures.

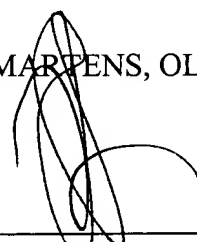
a 52. (New) The injection molding machine of Claim 51, further comprising a center platen having a first and a second side the center platen being arranged in a stack mold configuration with the at least first and second mold portions such that the first side of the center platen cooperates with the first mold portion thereby defining a first separation plane and the second side of the center platen cooperates with the second mold portion thereby defining a second separation plane and further comprising a temperature controller adapted to temperature regulate the injection molding machine at different temperatures adjacent the first and the second separation planes.

53. (New) The injection molding machine of Claim 52, wherein the injection molding machine is provided with a plurality of first, smaller cavities adjacent the first separation plane and a plurality of second, larger cavities adjacent the second separation plane.

Respectfully submitted,

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